

1. A fuel cell power system comprising:
a plurality of fuel cells electrically coupled with plural terminals and individually configured to convert chemical energy into electricity, wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with another of the fuel cells deactivated; and
a digital control system configured to at least one of control and monitor an operation of the fuel cells.
2. The fuel cell power system according to claim 1 wherein the control system is configured to control the operation.
3. The fuel cell power system according to claim 1 wherein the control system is configured to monitor the operation.
4. The fuel cell power system according to claim 1 wherein the fuel cells are coupled in series.
5. The fuel cell power system according to claim 1 wherein the control system comprises a plurality of distributed controllers.

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6. The fuel cell power system according to claim 5 wherein the distributed controllers are configured in a master/slave relationship.

7. The fuel cell power system according to claim 1 wherein the fuel cells comprise polymer electrolyte membrane fuel cells.

8. Canceled.

8/ 9. (Amended) The fuel cell power system according to claim 1 wherein the fuel cells are individually configured to be physically removable.

B 9/ 10. (Amended) The fuel cell power system according to claim 1 wherein the fuel cells are individually configured to be electrically bypassed.

11. The fuel cell power system according to claim 1 further comprising a plurality of switching devices configured to selectively shunt respective fuel cells.

12. The fuel cell power system according to claim 11 wherein the control system is configured to monitor at least one electrical characteristic of the fuel cells and to control the switching devices responsive to the monitoring.

13. The fuel cell power system according to claim 1 further comprising:
a housing about the fuel cells;
a temperature sensor within the housing; and
an air temperature control assembly configured to at least one of increase and decrease the temperature in the housing.

14. The fuel cell power system according to claim 13 wherein the control system is configured to monitor temperature using the temperature sensor and to control the air temperature control assembly responsive to the monitoring to maintain the temperature within the housing within a predefined range.

15. The fuel cell power system according to claim 13 wherein the control system is configured to monitor temperature using the temperature sensor and to control the air temperature control assembly responsive to the monitoring to maintain the temperature within the housing within a predefined range of approximately 25 °Celsius to 80 °Celsius.

16. The fuel cell power system according to claim 1 further comprising a fan configured to direct air to the fuel cells, and the control system is configured to control the fan.



17. The fuel cell power system according to claim 1 further comprising a plurality of valves configured to supply fuel to respective fuel cells, and the control system is configured to control the valves.

18. The fuel cell power system according to claim 1 further comprising a main valve configured to supply fuel to the fuel cells, and the control system is configured to control the main valve.

19. The fuel cell power system according to claim 1 further comprising a communication port adapted to couple with a remote device, and the control system is configured to communicate with the remote device via the communication port.

20. The fuel cell power system according to claim 1 wherein the control system is configured to implement a shut down operation to deactivate one or more of the fuel cells.

21. The fuel cell power system according to claim 20 wherein the control system is configured to implement the shut down operation to deactivate all the fuel cells.

22. The fuel cell power system according to claim 1 further comprising a switching device intermediate one of the terminals and the fuel cells, and the control system is configured to control the switching device.

23. The fuel cell power system according to claim 1 further comprising:
a housing about the fuel cells; and
a fuel sensor configured to monitor for the presence of fuel within the housing, and the control system is coupled with the fuel sensor and configured to implement a shut down operation responsive to a detection of fuel within the housing.

24. The fuel cell power system according to claim 1 wherein the fuel cells are provided in a plurality of cartridges.



25. A fuel cell power system comprising:
- a housing;
 - a plurality of terminals;
 - a plurality of fuel cells within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity;
 - a plurality of valves adapted to couple with a fuel source and configured to selectively supply fuel to respective fuel cells; and
 - a control system configured to control the plurality of valves.
26. The fuel cell power system according to claim 25 wherein the control system comprises a plurality of distributed controllers.
27. The fuel cell power system according to claim 25 wherein the fuel cells comprise polymer electrolyte membrane fuel cells.
28. The fuel cell power system according to claim 25 wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with others of the fuel cells deactivated.

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29. The fuel cell power system according to claim 28 wherein the fuel cells are individually configured to be physically removable.

30. The fuel cell power system according to claim 28 wherein the fuel cells are individually configured to be electrically bypassed.

31. The fuel cell power system according to claim 25 wherein the control system is configured to monitor at least one electrical characteristic of the fuel cells and to control the respective valves responsive to the monitoring.

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32. A fuel cell power system comprising:

a housing;

a plurality of terminals;

a plurality of fuel cells within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity, wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with another of the fuel cells deactivated;

a bleed valve configured to selectively purge matter from at least one of the fuel cells; and

a control system configured to control selective positioning of the bleed valve.

33. The fuel cell power system according to claim 32 wherein the control system comprises a plurality of distributed controllers.

34. The fuel cell power system according to claim 32 wherein the fuel cells comprise polymer electrolyte membrane fuel cells.

35. Canceled.

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36. Canceled.

37. The fuel cell power system according to claim 32 wherein the control system is configured to periodically open the bleed valve.

38. The fuel cell power system according to claim 32 further comprising a connection arranged to provide drainage from an anode side of at least one of the fuel cells to the bleed valve.

39. A fuel cell power system comprising:

a housing;

a plurality of terminals;

a plurality of fuel cells within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity, wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with another of the fuel cells deactivated;

a fan within the housing and configured to direct air to at least one of the fuel cells; and

a control system configured to control an operation of the fan.



40. The fuel cell power system according to claim 39 wherein the control system comprises a plurality of distributed controllers.

41. The fuel cell power system according to claim 39 wherein the fuel cells comprise polymer electrolyte membrane fuel cells.

42. ~~Canceled.~~

43. Canceled.

44. The fuel cell power system according to claim 39 further comprising at least one sensor configured to at least one of monitor current supplied to a load coupled with the terminals and monitor voltage of at least one of the fuel cells, and the control system is configured to control a rate of air flow of the fan responsive to the monitoring.

45. The fuel cell power system according to claim 39 wherein the fuel cells individually include a cathode side and the fan and the housing are configured to direct air into the cathode side of at least one of the fuel cells.

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46. The fuel cell power system according to claim 39 further comprising a plenum within the housing and configured to direct air from the fan to at least one of the fuel cells.

47. The fuel cell power system according to claim 46 wherein the plenum is configured to direct air to cathode sides of the fuel cells.

48. The fuel cell power system according to claim 39 further comprising an air flow device configured to operate responsive to control from the control system to permit selective passage of air at least one of into and out of the housing.

49. The fuel cell power system according to claim 39 further comprising monitoring circuitry configured to monitor an air flow rate of the fan and output a signal indicative of the air flow rate to the control system.

50. The fuel cell power system according to claim 49 wherein the control system is configured to control an air flow rate of the fan.



51. A fuel cell power system comprising:

a housing;

a plurality of terminals;

a plurality of fuel cells within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity, wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with another of the fuel cells deactivated;

a control system configured to at least one of control and monitor an operation of at least one of the fuel cells; and

an operator interface coupled with the control system to indicate at least one operational status responsive to control from the control system.

52. The fuel cell power system according to claim 51 wherein the control system comprises a plurality of distributed controllers.

53. The fuel cell power system according to claim 51 wherein the fuel cells comprise polymer electrolyte membrane fuel cells.

54. Canceled.



55. Canceled.

56. The fuel cell power system according to claim 51 wherein the operator interface is positioned for observation from the exterior of the housing.

57. The fuel cell power system according to claim 51 wherein the operator interface comprises a display configured to emit a human perceptible signal.

58. The fuel cell power system according to claim 51 wherein the operator interface comprises interface switches configured to receive operator inputs.

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58 59. (Amended) A fuel cell power system comprising:

a plurality of terminals;

at least one fuel cell electrically coupled with the terminals and configured to convert chemical energy into electricity;

a power supply comprising a battery;

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a control system configured to receive electricity from the battery and to at least one of control and monitor at least one operation of the at least one fuel cell; and

charge circuitry configured to selectively charge the battery responsive to control from the control system.

60. The fuel cell power system according to claim 59 wherein the control system comprises a plurality of distributed controllers.

61. The fuel cell power system according to claim 59 wherein the at least one fuel cell comprises a plurality of polymer electrolyte membrane fuel cells.

62. The fuel cell power system according to claim 59 wherein the at least one fuel cell comprises a plurality of fuel cells.

63. The fuel cell power system according to claim 62 wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with others of the fuel cells deactivated.

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64. (Amended) The fuel cell power system according to claim 59 wherein the control circuitry is configured to monitor an electrical condition of the battery and to control the charge circuitry to charge the battery responsive to the monitoring of the electrical condition of the battery.

65. The fuel cell power system according to claim 59 wherein the battery is configured to supply electricity to the control system during a start-up operation of the fuel cell power system.

66. Canceled.

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67. (Amended) The fuel cell power system according to claim ~~59~~ further comprising an operator interface and the control system is configured to control the operator interface to indicate the at least one operation.

68. A fuel cell power system comprising:

a plurality of terminals;

a plurality of fuel cells electrically coupled with the terminals and configured to convert chemical energy into electricity, wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with another of the fuel cells deactivated;

a sensor configured to monitor at least one electrical condition of at least one of the fuel cells; and

a control system coupled with the sensor and configured to monitor the sensor.

69. The fuel cell power system according to claim 68 wherein the control system comprises a plurality of distributed controllers.

70. The fuel cell power system according to claim 68 wherein the fuel cells comprise polymer electrolyte membrane fuel cells.

71. Canceled.

72. Canceled.

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73. The fuel cell power system according to claim 68 further comprising an operator interface and the control system is configured to control the operator interface to indicate the at least one electrical condition.

74. The fuel cell power system according to claim 68 further comprising a fan configured to direct air to at least one of the fuel cells and the control system is configured to control the fan responsive to the at least one electrical condition.

75. A fuel cell power system comprising:
a plurality of terminals;
a plurality of fuel cells electrically coupled with the terminals and configured to convert chemical energy into electricity;
a main valve adapted to couple with a fuel source;
a plurality of auxiliary valves in fluid communication with the main valve and configured to selectively supply fuel to respective fuel cells; and
a control system configured to control the main valve.

76. The fuel cell power system according to claim 75 wherein the control system comprises a plurality of distributed controllers.



77. The fuel cell power system according to claim 75 wherein the fuel cells comprise polymer electrolyte membrane fuel cells.

78. The fuel cell power system according to claim 75 wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with others of the fuel cells deactivated.

79. The fuel cell power system according to claim 75 wherein the auxiliary valves are positioned intermediate the main valve and respective fuel cells.

80. A fuel cell power system comprising:

a housing;

a plurality of terminals;

at least one fuel cell within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity;

an air temperature control assembly configured to direct air within the housing to the at least one fuel cell and comprising a modifying element configured to condition the temperature of the air; and

a control system configured to control the modifying element.

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81. The fuel cell power system according to claim 80 wherein the control system comprises a plurality of distributed controllers.

82. The fuel cell power system according to claim 80 wherein the at least one fuel cell comprises a plurality of polymer electrolyte membrane fuel cells.

83. The fuel cell power system according to claim 80 wherein the at least one fuel cell comprises a plurality of fuel cells.

84. The fuel cell power system according to claim 83 wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with others of the fuel cells deactivated.

85. The fuel cell power system according to claim 80 further comprising a temperature sensor configured to monitor the temperature of the directed air within the housing.

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86. The fuel cell power system according to claim 85 wherein the control system is configured to monitor the temperature of the directed air from the temperature sensor and to control the modifying element responsive to the monitoring of the temperature.

87. The fuel cell power system according to claim 80 wherein the modifying element comprises a heater.

88. A fuel cell power system comprising:
a housing;
a plurality of terminals;
at least one fuel cell within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity;
a hydrogen sensor positioned within the housing; and
a control system configured to monitor a detection of hydrogen within the housing using the hydrogen sensor.

89. The fuel cell power system according to claim 88 wherein the control system comprises a plurality of distributed controllers.



90. The fuel cell power system according to claim 88 wherein the at least one fuel cell comprises a plurality of polymer electrolyte membrane fuel cells.

91. The fuel cell power system according to claim 88 wherein the at least one fuel cell comprises a plurality of fuel cells.

92. The fuel cell power system according to claim 91 wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with others of the fuel cells deactivated.

93. The fuel cell power system according to claim 88 further comprising an operator interface and the control system is configured to control the operator interface to indicate a detection of hydrogen.

94. The fuel cell power system according to claim 88 further comprising a fuel delivery system configured to supply hydrogen to the at least one fuel cell.

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95. The fuel cell power system according to claim 94 wherein the at least one fuel cell comprises a plurality of fuel cells, and the fuel delivery system comprises a plurality of valves configured to supply hydrogen to respective ones of the fuel cells.

96. The fuel cell power system according to claim 95 wherein the control system is configured to selectively close the valves responsive to a detection of hydrogen using the hydrogen sensor.

97. The fuel cell power system according to claim 88 further comprising a heater configured to selectively impart heat flux to the hydrogen sensor.

98. A fuel cell power system comprising:
a housing;
a plurality of terminals;
at least one fuel cell within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity;
a temperature sensor within the housing; and
a control system coupled with the temperature sensor and configured to monitor the temperature in the housing using the temperature sensor.



99. The fuel cell power system according to claim 98 wherein the control system comprises a plurality of distributed controllers.

100. The fuel cell power system according to claim 98 wherein the at least one fuel cell comprises a plurality of polymer electrolyte membrane fuel cells.

101. The fuel cell power system according to claim 98 wherein the at least one fuel cell comprises a plurality of fuel cells.

102. The fuel cell power system according to claim 101 wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with others of the fuel cells deactivated.

103. The fuel cell power system according to claim 98 further comprising an air temperature control assembly configured to at least one of increase and decrease the temperature in the housing.

104. The fuel cell power system according to claim 103 wherein the control system is configured to control the air temperature control assembly.



105. The fuel cell power system according to claim 103 wherein the control system is configured to control the air temperature control assembly to maintain the temperature in the housing within a predefined range.

106. The fuel cell power system according to claim 103 wherein the control system is configured to control the air temperature control assembly to maintain the temperature in the housing within a predefined range of approximately 25 °Celsius to 80 °Celsius.

107. The fuel cell power system according to claim 103 wherein the air temperature control assembly comprises:

a fan configured to circulate air within the housing; and

an air flow device configured to permit selective passage of air at least one of into and out of the housing.

108. The fuel cell power system according to claim 107 wherein the control system is configured to control the fan and the air flow device.

109. The fuel cell power system according to claim 98 further comprising a temperature sensor configured to monitor a temperature exterior of the housing.

110. A fuel cell power system comprising:
a plurality of terminals;
a plurality of fuel cells within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity;
a plurality of switching devices individually configured to selectively shunt at least one of the fuel cells; and
a control system configured to control the switching devices.

111. The fuel cell power system according to claim 110 wherein the control system comprises a plurality of distributed controllers.

112. The fuel cell power system according to claim 110 wherein the at least one fuel cell comprises a plurality of polymer electrolyte membrane fuel cells.

113. The fuel cell power system according to claim 110 wherein the at least one fuel cell comprises a plurality of fuel cells.

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114. The fuel cell power system according to claim 113 wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with others of the fuel cells deactivated.

115. The fuel cell power system according to claim 110 wherein the control system is configured to shunt the at least one fuel cell for a variable period of time.

116. Canceled.

117. The fuel cell power system according to claim 110 wherein the control system is configured to sequentially shunt the fuel cells using the respective switching devices.

118. The fuel cell power system according to claim 110 wherein the control system is configured to shunt individual ones of the fuel cells using the respective switching devices.

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119. The fuel cell power system according to claim 118 wherein the control system is configured to shunt the individual ones of the fuel cells according to a specified order.

120. The fuel cell power system according to claim 110 further comprising a plurality of valves individually configured to selectively supply fuel to respective fuel cells, and wherein the control system is configured to control the valves.

121. The fuel cell power system according to claim 120 wherein the control system is configured to cease supply of fuel to shunted fuel cells using respective ones of the valves.

122. The fuel cell power system according to claim 110 wherein the switching devices comprise MOSFET switching devices.



123. A fuel cell power system comprising:

a housing;

a plurality of terminals;

at least one fuel cell within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity;

a switching device coupled intermediate the at least one fuel cell and one of the terminals;

a control system coupled with the switching device and configured to control the switching device to selectively couple the terminal with the at least one fuel cell; and

a temperature sensor positioned within the housing, wherein the control system is configured to monitor the temperature within the housing and to couple the terminal with the at least one fuel cell using the switching device responsive to the temperature being within a predefined range.

124. The fuel cell power system according to claim 123 wherein the control system comprises a plurality of distributed controllers.

125. The fuel cell power system according to claim 123 wherein the at least one fuel cell comprises a plurality of polymer electrolyte membrane fuel cells.



126. The fuel cell power system according to claim 123 wherein the at least one fuel cell comprises a plurality of fuel cells.

127. The fuel cell power system according to claim 126 wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with others of the fuel cells deactivated.

128. The fuel cell power system according to claim 123 wherein the switching device comprises at least one MOSFET switching device.

129. The fuel cell power system according to claim 123 wherein the terminals are adapted to be electrically coupled with a load.

130. A method of controlling a fuel cell power system comprising:
providing a plurality of fuel cells individually configured to convert chemical energy into electricity;
electrically coupling the plurality of fuel cells;
providing a first terminal coupled with the fuel cells;
providing a second terminal coupled with the fuel cells;
coupling a digital control system with the fuel cells to at least one of monitor and control an operation of the fuel cells; and
deactivating at least one of the fuel cells.

131. The method according to claim 130 further comprising monitoring the operation of the fuel cells.

132. The method according to claim 130 further comprising controlling the operation of the fuel cells.

133. The method according to claim 130 wherein the coupling the control system comprises coupling a plurality of distributed controllers.

134. The method according to claim 130 wherein the providing the fuel cells comprises providing polymer electrolyte membrane fuel cells.

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135. The method according to claim 130 further comprising controlling the deactivating using the digital control system.

136. The method according to claim 130 wherein the deactivating comprises physically removing.

137. The method according to claim 130 wherein the deactivating comprises electrically bypassing.

138. The method according to claim 130 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

139. The method according to claim 130 further comprising selectively shunting at least one of the fuel cells.

140. The method according to claim 130 further comprising:
monitoring at least one electrical characteristic of the fuel cells; and
shunting at least one of the fuel cells responsive to the monitoring.

141. The method according to claim 130 further comprising maintaining an air temperature about the fuel cells in a predefined range.

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142. The method according to claim 130 further comprising maintaining an air temperature about the fuel cells in a predefined range of approximately 25 °Celsius to 80 °Celsius.

143. The method according to claim 130 further comprising directing air to the fuel cells using a fan.

144. The method according to claim 143 further comprising:
monitoring a load coupled with the terminals; and
controlling the fan responsive to the monitoring using the control system.

145. The method according to claim 130 further comprising:
supplying fuel to the fuel cells using a plurality of auxiliary valves; and
controlling the auxiliary valves using the control system.

146. The method according to claim 145 further comprising:
supplying fuel to the auxiliary valves using a main valve; and
controlling the main valve using the control system.

147. The method according to claim 130 further comprising:
communicating with a remote device using a communication port; and
controlling the communicating using the control system.

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148. The method according to claim 130 further comprising:
switching a connection intermediate one of the terminals and the fuel cells;
and
controlling the switching using the control system.

149. The method according to claim 130 further comprising:
monitoring for the presence of fuel within a housing about the fuel cells;
and
implementing a shut down operation responsive to the monitoring using the
control system.

150. The method according to claim 149 wherein the implementing
comprises the deactivating.

151. The method according to claim 149 wherein the implementing
comprises deactivating all of the fuel cells.

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152. A method of controlling a fuel cell power system comprising:
providing a plurality of fuel cells configured to convert chemical energy into electricity;

providing a first terminal coupled with the fuel cells;

providing a second terminal coupled with the fuel cells;

supplying fuel to the fuel cells;

controlling the supplying using a control system; and

deactivating at least one of the fuel cells.

153. The method according to claim 152 wherein the controlling comprises controlling using the control system comprising a plurality of distributed controllers.

154. The method according to claim 152 wherein the providing the fuel cells comprises providing polymer electrolyte membrane fuel cells.

155. The method according to claim 152 further comprising controlling the deactivating using the control system.

156. The method according to claim 152 further comprising controlling the deactivating using the control system and the controlling the supplying comprises ceasing delivery of the fuel to the at least one deactivated fuel cell.

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157. The method according to claim 152 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

158. The method according to claim 152 further comprising monitoring at least one electrical characteristic of the at least one deactivated fuel cell, and the deactivating is responsive to the monitoring.

148 159. (Amended) A method of controlling a fuel cell power system comprising:

providing a plurality of fuel cells configured to convert chemical energy into electricity;

providing a first terminal coupled with at least one of the fuel cells;

providing a second terminal coupled with at least one of the fuel cells;

selectively bleeding a connection coupled with at least one of the fuel cells to purge matter from the at least one fuel cell coupled with the connection;

controlling the bleeding using a control system; and

deactivating at least one of the fuel cells.

160. The method according to claim 159 wherein the controlling comprises controlling using the control system comprising a plurality of distributed controllers.

161. The method according to claim 159 wherein the providing the at least one fuel cell comprises providing the at least one fuel cell having a plurality of polymer electrolyte membrane fuel cells.

162. Canceled.

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163. Canceled.

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151 164. (Amended) The method according to claim 159 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

165. The method according to claim 159 wherein the selectively bleeding comprises periodically bleeding responsive to control of the control system.

166. The method according to claim 159 wherein the bleeding comprises bleeding using a bleed valve.

167. The method according to claim 159 wherein the bleeding comprises bleeding from an anode of the at least one fuel cell.

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168. A method of controlling a fuel cell power system comprising:
providing at least one fuel cell configured to convert chemical energy into electricity;

providing a first terminal coupled with the at least one fuel cell;
providing a second terminal coupled with the at least one fuel cell;
monitoring the temperature of the air;
directing air to the at least one fuel cell; and
controlling the directing using a control system.

169. The method according to claim 168 wherein the controlling comprises controlling using the control system comprising a plurality of distributed controllers.

170. The method according to claim 168 wherein the providing the at least one fuel cell comprises providing the at least one fuel cell having a plurality of polymer electrolyte membrane fuel cells.

171. The method according to claim 168 wherein the providing the at least one fuel cell comprises providing a plurality of fuel cells.

172. The method according to claim 171 further comprising deactivating at least one of the fuel cells.

173. The method according to claim 172 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

174. The method according to claim 168 further comprising providing electricity to a load coupled with the terminals, monitoring the providing of electricity, and the controlling is responsive to the monitoring of the providing of electricity.

175. The method according to claim 168 further comprising monitoring at least one of voltage of the at least one fuel cell and current passing through the at least one fuel cell, and the controlling is responsive to the monitoring of at least one of voltage and current.

176. The method according to claim 168 wherein the directing comprises directing air into a cathode side of the at least one fuel cell.

177. The method according to claim 176 wherein the directing comprises directing using a fan, and the controlling comprises controlling an air flow rate of the fan.

178. The method according to claim 168 further comprising introducing exterior air into a housing about the at least one fuel cell.

179. The method according to claim 168 wherein the controlling is responsive to the monitoring.

180. The method according to claim 168 further comprising controlling a modifying element using the control system to control the temperature of the air responsive to the monitoring.

181. A method of controlling a fuel cell power system comprising:
providing at least one fuel cell configured to convert chemical energy into electricity;

providing a first terminal coupled with the at least one fuel cell;

providing a second terminal coupled with the at least one fuel cell;

indicating at least one operational status of the fuel cell power system using an operator interface; and

controlling the indicating using a control system; and

forwarding the at least one operational status to a remote device.

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182. The method according to claim 181 wherein the controlling comprises controlling using the control system comprising a plurality of distributed controllers.

183. The method according to claim 181 wherein the providing the at least one fuel cell comprises providing the at least one fuel cell having a plurality of polymer electrolyte membrane fuel cells.

184. The method according to claim 181 wherein the providing the at least one fuel cell comprises providing a plurality of fuel cells.

185. The method according to claim 184 further comprising deactivating at least one of the fuel cells.

186. The method according to claim 185 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

187. The method according to claim 181 wherein the indicating comprises emitting a human perceptible signal.

188. The method according to claim 181 wherein the indicating comprises indicating using a display.

189. The method according to claim 181 further comprising receiving communications from the remote device.

190. The method according to claim 181 further comprising receiving operator inputs using the operator interface.

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170 191. (Amended) A method of controlling a fuel cell power system comprising:

providing a plurality of fuel cells configured to convert chemical energy into electricity;

providing a first terminal coupled with at least one fuel cell;

providing a second terminal coupled with at least one fuel cell;

supplying electricity to a control system using a power supply comprising a battery;

monitoring at least one operation of at least one of the fuel cells using the control system; and

deactivating at least one of the fuel cells.

192. The method according to claim 191 wherein the controlling comprises controlling using the control system comprising a plurality of distributed controllers.

193. The method according to claim 191 wherein the providing the at least one fuel cell comprises providing the fuel cell having a plurality of polymer electrolyte membrane fuel cells.

194. Canceled.

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195. Canceled.

181 196. (Amended) 178 The method according to claim 191 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

197. The method according to claim 191 further comprising monitoring an electrical condition of the battery and controlling charging of the battery responsive to the monitoring of the electrical condition of the battery.

198. The method according to claim 191 wherein the supplying comprises supplying power using the battery to the control system during a start-up operation of the fuel cell power system.

199. The method according to claim 191 further comprising:
charging the battery; and
controlling the charging using the control system.

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200. A method of controlling a fuel cell power system comprising:
providing at least one fuel cell configured to convert chemical energy into electricity;
providing a first terminal coupled with the at least one fuel cell;
providing a second terminal coupled with the at least one fuel cell;
monitoring an electrical condition of the at least one fuel cell using a control system; and
shunting the at least one fuel cell after the monitoring.

201. The method according to claim 200 wherein the controlling comprises controlling using the control system comprising a plurality of distributed controllers.

202. The method according to claim 200 wherein the providing the at least one fuel cell comprises providing the fuel cell having a plurality of polymer electrolyte membrane fuel cells.

203. The method according to claim 200 wherein the providing the at least one fuel cell comprises providing a plurality of fuel cells.

204. The method according to claim 203 further comprising deactivating at least one of the fuel cells.

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205. The method according to claim 204 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

206. The method according to claim 200 further comprising indicating the electrical condition using an operator interface.

207. The method according to claim 200 further comprising:
directing air to the at least one fuel cell; and
controlling the directing using the control system responsive to the monitoring.

208. The method according to claim 200 wherein the shunting is responsive to the monitoring.

209. A method of controlling a fuel cell power system comprising:

- providing a plurality of fuel cells individually configured to convert chemical energy into electricity;
- providing a first terminal coupled with the fuel cells;
- providing a second terminal coupled with the fuel cells;
- supplying fuel to the fuel cells, wherein the supplying comprises:
 - supplying using a main valve; and
 - supplying using a plurality of auxiliary valves in fluid communication with the main valve and respective fuel cells; and
- controlling the supplying using a control system.

210. The method according to claim 209 wherein the controlling comprises controlling using the control system comprising a plurality of distributed controllers.

211. The method according to claim 209 wherein the providing the fuel cells comprises providing a plurality of polymer electrolyte membrane fuel cells.

212. The method according to claim 209 further comprising deactivating at least one of the fuel cells.



213. The method according to claim 212 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

214. The method according to claim 209 wherein the supplying comprises supplying using the auxiliary valves positioned intermediate the main valve and the respective fuel cells.

215. The method according to claim 209 wherein the supplying comprises selectively ceasing the supplying of fuel to at least one of the fuel cells using a respective one of the auxiliary valves.

216. The method according to claim 209 wherein the controlling comprises controlling the main valve and the auxiliary valves using the control system.

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217. A method of controlling a fuel cell power system comprising:
providing at least one fuel cell configured to convert chemical energy into electricity;
providing a first terminal coupled with the at least one fuel cell;
providing a second terminal coupled with the at least one fuel cell;
supplying fuel to the at least one fuel cell; and
monitoring for the presence of fuel within a housing about the at least one fuel cell using a control system.

218. The method according to claim 217 wherein the controlling comprises controlling using the control system comprising a plurality of distributed controllers.

219. The method according to claim 217 wherein the providing the at least one fuel cell comprises providing the fuel cell having a plurality of polymer electrolyte membrane fuel cells.

220. The method according to claim 217 wherein the providing the at least one fuel cell comprises providing a plurality of fuel cells.

221. The method according to claim 220 further comprising deactivating at least one of the fuel cells.

222. The method according to claim 221 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

223. The method according to claim 217 further comprising:
coupling an operator interface with the control system; and
controlling the operator interface using the control system to indicate the presence of fuel within the housing.

224. The method according to claim 217 further comprising:
selectively ceasing the supplying responsive to the monitoring; and
controlling the ceasing using the control system.

225. The method according to claim 217 wherein the monitoring comprises monitoring using a fuel sensor.

226. The method according to claim 225 further comprising heating the fuel sensor.

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227. A method of controlling a fuel cell power system comprising:
providing at least one fuel cell configured to convert chemical energy into electricity;
providing a first terminal coupled with the at least one fuel cell;
providing a second terminal coupled with the at least one fuel cell; and
monitoring a temperature within a housing about the at least one fuel cell using a control system.

228. The method according to claim 227 wherein the controlling comprises controlling using the control system comprising a plurality of distributed controllers.

229. The method according to claim 227 wherein the providing the at least one fuel cell comprises providing the fuel cell having a plurality of polymer electrolyte membrane fuel cells.

230. The method according to claim 227 wherein the providing the at least one fuel cell comprises providing a plurality of fuel cells.

231. The method according to claim 230 further comprising deactivating at least one of the fuel cells.

232. The method according to claim 231 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

233. The method according to claim 227 further comprising selectively one of increasing and decreasing the temperature in the housing using an air temperature control assembly.

234. The method according to claim 233 further comprising controlling the air temperature control assembly using the control system and responsive to the monitoring.

235. The method according to claim 234 wherein the controlling comprises controlling to maintain the temperature in the housing within a predefined range.

236. The method according to claim 234 wherein the controlling comprises controlling to maintain the temperature in the housing within a predefined range of approximately 25 °Celsius and 80 °Celsius.

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237. The method according to claim 227 further comprising:
directing air to the at least one fuel cell; and
controlling the directing using the control system and responsive to the monitoring.

238. The method according to claim 227 further comprising:
inputting exterior air into the housing; and
controlling the inputting using the control system and responsive to the monitoring.

239. The method according to claim 227 further comprising monitoring a temperature exterior of the housing.

240. The method according to claim 227 wherein the monitoring comprises monitoring using a temperature sensor.

B

241. A method of controlling a fuel cell power system comprising:
providing a plurality of fuel cells configured to convert chemical energy into electricity;

providing a first terminal coupled with the fuel cells;

providing a second terminal coupled with the fuel cells;

shunting the fuel cells according to a specified order; and

controlling the shunting using a control system.

242. The method according to claim 241 wherein the controlling comprises controlling using the control system comprising a plurality of distributed controllers.

243. The method according to claim 241 wherein the providing the fuel cells comprises providing polymer electrolyte membrane fuel cells.

244. The method according to claim 241 further comprising varying a period of time of the shunting using the control system.

245. Canceled.

246. The method according to claim 241 further comprising deactivating at least one of the fuel cells.

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247. The method according to claim 246 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

248. The method according to claim 241 wherein the shunting according to the specified order comprises sequentially shunting the fuel cells.

249. The method according to claim 241 further comprising:
detecting a failed one of the fuel cells; and
ceasing supply of fuel to the failed fuel cell responsive to the detecting.

250. The method according to claim 249 wherein the detecting comprises monitoring an electrical characteristic of the fuel cells.

251. The method according to claim 241 further comprising:
detecting the presence of fuel; and
ceasing the supplying responsive to the detecting.

B

252. A method of controlling a fuel cell power system comprising:
providing at least one fuel cell configured to convert chemical energy into electricity;

providing a first terminal coupled with the at least one fuel cell;

providing a second terminal coupled with the at least one fuel cell;

switching a connection immediate one of the terminals and the at least one fuel cell;

controlling the switching using a control system; and

monitoring a temperature within a housing about the at least one fuel cell
and wherein the controlling is responsive to the monitoring.

253. The method according to claim 252 wherein the controlling comprises controlling using the control system comprising a plurality of distributed controllers.

254. The method according to claim 252 wherein the providing the at least one fuel cell comprises providing the fuel cell having a plurality of polymer electrolyte membrane fuel cells.

255. The method according to claim 252 wherein the providing the at least one fuel cell comprises providing a plurality of fuel cells.

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256. The method according to claim 255 further comprising deactivating at least one of the fuel cells.

257. The method according to claim 256 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

258. The method according to claim 252 further comprising monitoring an electrical characteristic of the at least one fuel cell and the controlling is responsive to the monitoring.

259. A method of operating a fuel cell power system comprising:
initiating a start-up procedure;
monitoring the temperature within a housing containing at least one fuel cell;
selectively adjusting the temperature within the housing using a modifying element responsive to the monitoring; and
coupling a power bus with a terminal responsive to the monitoring.

260. The method according to claim 259 further comprising monitoring for the presence of fuel.

B

261. The method according to claim 259 further comprising:
shunting the at least one fuel cell according to a duty cycle; and
selectively setting the duty cycle to maximum.

262. The method according to claim 259 wherein the adjusting comprises
heating using the modifying element to increase the temperature.

263. A fuel cell power system comprising:
a plurality of fuel cells electrically coupled with plural terminals and
individually configured to convert chemical energy into electricity; and
a digital control system comprising a plurality of distributed controllers
configured to at least one of control and monitor an operation of the fuel cells.

264. The fuel cell power system according to claim 263 wherein the
distributed controllers are configured in a master\slave relationship.

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265. A fuel cell power system comprising:

a plurality of fuel cells electrically coupled with plural terminals and individually configured to convert chemical energy into electricity;

a digital control system configured to at least one of control and monitor an operation of the fuel cells; and

a plurality of valves configured to supply fuel to respective fuel cells, and the control system is configured to control the valves.

266. A fuel cell power system comprising:

a plurality of fuel cells electrically coupled with plural terminals and individually configured to convert chemical energy into electricity;

a digital control system configured to at least one of control and monitor an operation of the fuel cells; and

a communication port adapted to couple with a remote device, and the control system is configured to communicate with the remote device via the communication port.

B

267. A fuel cell power system comprising:

a plurality of fuel cells electrically coupled with plural terminals and individually configured to convert chemical energy into electricity;

a digital control system configured to at least one of control and monitor an operation of the fuel cells; and

a switching device intermediate one of the terminals and the fuel cells, and the control system is configured to control the switching device.

268. A fuel cell power system comprising:

a plurality of fuel cells electrically coupled with plural terminals and individually configured to convert chemical energy into electricity;

a digital control system configured to at least one of control and monitor an operation of the fuel cells;

a housing about the fuel cells; and

a fuel sensor configured to monitor for the presence of fuel within the housing, and the control system is coupled with the fuel sensor and configured to implement a shut down operation responsive to a detection of fuel within the housing.

B

269. A fuel cell power system comprising:

a housing;

a plurality of terminals;

at least one fuel cell within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity;

a bleed valve configured to selectively purge matter from the at least one fuel cell; and

a control system comprising a plurality of distributed controllers, wherein the control system is configured to control selective positioning of the bleed valve.

270. A fuel cell power system comprising:

a housing;

a plurality of terminals;

at least one fuel cell within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity;

a fan within the housing and configured to direct air to the at least one fuel cell; and

a control system comprising a plurality of distributed controllers, wherein the control system is configured to control an operation of the fan.

B

271. A fuel cell power system comprising:

a housing;

a plurality of terminals;

at least one fuel cell within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity;

a control system comprising a plurality of distributed controllers, wherein the control system is configured to at least one of control and monitor an operation of the at least one fuel cell; and

an operator interface coupled with the control system to indicate at least one operational status of the fuel cell power system responsive to control from the control system.

272. A fuel cell power system comprising:

a plurality of terminals;

at least one fuel cell electrically coupled with the terminals and configured to convert chemical energy into electricity;

a sensor configured to monitor at least one electrical condition of the at least one fuel cell; and

a control system comprising a plurality of distributed controllers, wherein the control system is coupled with the sensor and configured to monitor the sensor.

B

273. A fuel cell power system comprising:

a plurality of terminals;

a plurality of fuel cells electrically coupled with the terminals and configured to convert chemical energy into electricity, wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with another of the fuel cells deactivated;

a main valve adapted to couple with a fuel source and configured to selectively supply fuel to the fuel cells; and

a control system configured to control the main valve.

274. A fuel cell power system comprising:

a housing;

a plurality of terminals;

at least one fuel cell within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity;

a fuel delivery system configured to supply fuel to the at least one fuel cell;

a fuel sensor positioned within the housing; and

a control system comprising a plurality of distributed controllers, wherein the control system is configured to monitor a detection of fuel within the housing using the fuel sensor.

B

275. A fuel cell power system comprising:

a housing;

a plurality of terminals;

a plurality of fuel cells within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity, wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with another of the fuel cells deactivated;

a fuel delivery system configured to supply fuel to the at least one fuel cell;

a fuel sensor positioned within the housing; and

a control system configured to monitor a detection of fuel within the housing using the fuel sensor.

B

276. A fuel cell power system comprising:

- a housing;
- a plurality of terminals;
- a plurality of fuel cells within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity;
- a fuel delivery system comprising a plurality of valves configured supply fuel to respective ones of the fuel cells;
- a fuel sensor positioned within the housing; and
- a control system configured to monitor a detection of fuel within the housing using the fuel sensor.

277. The fuel cell power system according to claim 276 wherein the control system is configured to selectively close the valves responsive to a detection of fuel using the fuel sensor.

B

278. A fuel cell power system comprising:

a plurality of terminals;

at least one fuel cell within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity;

at least one switching device configured to selectively shunt the at least one fuel cell; and

a control system comprising a plurality of distributed controllers, wherein the control system is configured to control the at least one switching device.

279. A fuel cell power system comprising:

a plurality of terminals;

a plurality of fuel cells within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity, wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with another of the fuel cells deactivated;

at least one switching device configured to selectively shunt at least one of the fuel cells; and

a control system configured to control the at least one switching device.

B

280. A fuel cell power system comprising:

a housing;

a plurality of terminals;

at least one fuel cell within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity;

a switching device coupled intermediate the at least one fuel cell and one of the terminals; and

a control system comprising a plurality of distributed controllers, wherein the control system is coupled with the switching device and configured to control the switching device to selectively couple the terminal with the at least one fuel cell.

281. A method of controlling a fuel cell power system comprising:

providing a plurality of fuel cells individually configured to convert chemical energy into electricity;

electrically coupling the plurality of fuel cells;

providing a first terminal coupled with the fuel cells;

providing a second terminal coupled with the fuel cells;

providing a digital control system comprising a plurality of distributed controllers; and

coupling the digital control system with the fuel cells to at least one of monitor and control an operation of the fuel cells.

B

282. A method of controlling a fuel cell power system comprising:

- providing a plurality of fuel cells individually configured to convert chemical energy into electricity;
- electrically coupling the plurality of fuel cells;
- providing a first terminal coupled with the fuel cells;
- providing a second terminal coupled with the fuel cells;
- selectively shunting at least one of the fuel cells; and
- coupling a digital control system with the fuel cells to at least one of monitor and control an operation of the fuel cells.

283. The method according to claim 282 further comprising monitoring at least one electrical characteristic of the fuel cells, and wherein the shunting comprises shunting responsive to the monitoring.

B

284. A method of controlling a fuel cell power system comprising:

- providing a plurality of fuel cells individually configured to convert chemical energy into electricity;
- electrically coupling the plurality of fuel cells;
- providing a first terminal coupled with the fuel cells;
- providing a second terminal coupled with the fuel cells;
- coupling a digital control system with the fuel cells to at least one of monitor and control an operation of the fuel cells;
- supplying fuel to the fuel cells using a plurality of auxiliary valves in fluid communication with the fuel cells; and
- controlling the auxiliary valves using the control system.

285. The method according to claim 284 further comprising:

- supplying fuel to the auxiliary valves using a main valve; and
- controlling the main valve using the control system.

B

286. A method of controlling a fuel cell power system comprising:

- providing a plurality of fuel cells individually configured to convert chemical energy into electricity;
- electrically coupling the plurality of fuel cells;
- providing a first terminal coupled with the fuel cells;
- providing a second terminal coupled with the fuel cells;
- coupling a digital control system with the fuel cells to at least one of monitor and control an operation of the fuel cells;
- communicating with a remote device using a communication port; and
- controlling the communicating using the control system.

B

287. A method of controlling a fuel cell power system comprising:

- providing a plurality of fuel cells individually configured to convert chemical energy into electricity;
- electrically coupling the plurality of fuel cells;
- providing a first terminal coupled with the fuel cells;
- providing a second terminal coupled with the fuel cells;
- coupling a digital control system with the fuel cells to at least one of monitor and control an operation of the fuel cells;
- monitoring for the presence of fuel within a housing about the fuel cells;
- and
- implementing a shut down operation responsive to the monitoring using the control system.

288. The method according to claim 287 wherein the implementing deactivates one or more of the fuel cells.

289. The method according to claim 287 wherein the implementing deactivates all of the fuel cells.

B

290. A method of controlling a fuel cell power system comprising:
providing at least one fuel cell configured to convert chemical energy into electricity;

providing a first terminal coupled with the at least one fuel cell;
providing a second terminal coupled with the at least one fuel cell;
providing a control system comprising a plurality of distributed controllers;
supplying fuel to the at least one fuel cell; and
controlling the supplying using the control system.

291. A method of controlling a fuel cell power system comprising:
providing at least one fuel cell configured to convert chemical energy into electricity;

providing a first terminal coupled with the at least one fuel cell;
providing a second terminal coupled with the at least one fuel cell;
providing a control system comprising a plurality of distributed controllers;
directing air to the at least one fuel cell; and
controlling the directing using the control system.

B

292. A method of controlling a fuel cell power system comprising:

- providing a plurality of fuel cells configured to convert chemical energy into electricity;
- providing a first terminal coupled with the fuel cells;
- providing a second terminal coupled with the fuel cells;
- directing air to the fuel cells;
- deactivating at least one of the fuel cells; and
- controlling the directing using a control system.

293. The method according to claim 292 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

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294. A method of controlling a fuel cell power system comprising:
providing at least one fuel cell configured to convert chemical energy into electricity;
providing a first terminal coupled with the at least one fuel cell;
providing a second terminal coupled with the at least one fuel cell;
providing electricity to a load coupled with the terminals;
monitoring the providing the electricity;
directing air to the at least one fuel cell; and
controlling the directing using a control system responsive to the monitoring.

295. A method of controlling a fuel cell power system comprising:
providing at least one fuel cell configured to convert chemical energy into electricity;
providing a first terminal coupled with the at least one fuel cell;
providing a second terminal coupled with the at least one fuel cell;
providing a control system comprising a plurality of distributed controllers;
indicating at least one operational status of the fuel cell power system using an operator interface; and
controlling the indicating using the control system.

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296. A method of controlling a fuel cell power system comprising:

- providing a plurality of fuel cells configured to convert chemical energy into electricity;
- providing a first terminal coupled with the fuel cells;
- providing a second terminal coupled with the fuel cells;
- deactivating at least one of the fuel cells;
- indicating at least one operational status of the fuel cell power system using an operator interface; and
- controlling the indicating using a control system.

297. The method according to claim 296 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

B

298. A method of controlling a fuel cell power system comprising:
providing at least one fuel cell configured to convert chemical energy into electricity;
providing a first terminal coupled with the at least one fuel cell;
providing a second terminal coupled with the at least one fuel cell;
providing a control system comprising a plurality of distributed controllers;
and
monitoring an electrical condition of the at least one fuel cell using the control system.

299. A method of controlling a fuel cell power system comprising:
providing a plurality of fuel cells configured to convert chemical energy into electricity;
providing a first terminal coupled with the fuel cells;
providing a second terminal coupled with the fuel cells;
monitoring an electrical condition of at least one of the fuel cells using a control system; and
deactivating at least one of the fuel cells.

300. The method according to claim 299 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

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301. A method of controlling a fuel cell power system comprising:
providing a plurality of fuel cells individually configured to convert chemical energy into electricity;
providing a first terminal coupled with the fuel cells;
providing a second terminal coupled with the fuel cells;
providing a control system comprising a plurality of distributed controllers;
supplying fuel to the fuel cells; and
controlling the supplying using the control system.

302. A method of controlling a fuel cell power system comprising:
providing a plurality of fuel cells individually configured to convert chemical energy into electricity;
providing a first terminal coupled with the fuel cells;
providing a second terminal coupled with the fuel cells;
supplying fuel to the fuel cells;
controlling the supplying using a control system; and
deactivating at least one of the fuel cells.

303. The method according to claim 302 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

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304. A method of controlling a fuel cell power system comprising:
providing at least one fuel cell configured to convert chemical energy into electricity;

providing a first terminal coupled with the at least one fuel cell;
providing a second terminal coupled with the at least one fuel cell;
providing a control system comprising a plurality of distributed controllers;
shunting the at least one fuel cell; and
controlling the shunting using the control system.

305. A method of controlling a fuel cell power system comprising:
providing at least one fuel cell configured to convert chemical energy into electricity;

providing a first terminal coupled with the at least one fuel cell;
providing a second terminal coupled with the at least one fuel cell;
providing a control system comprising a plurality of distributed controllers;
switching a connection immediate one of the terminals and the at least one fuel cell; and
controlling the switching using the control system.

300. The method according to claim 299 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

301. A method of controlling a fuel cell power system comprising:
providing a plurality of fuel cells individually configured to convert chemical energy into electricity;
providing a first terminal coupled with the fuel cells;
providing a second terminal coupled with the fuel cells;
providing a control system comprising a plurality of distributed controllers;
supplying fuel to the fuel cells; and
controlling the supplying using the control system.

302. A method of controlling a fuel cell power system comprising:
providing a plurality of fuel cells individually configured to convert chemical energy into electricity;
providing a first terminal coupled with the fuel cells;
providing a second terminal coupled with the fuel cells;
supplying fuel to the fuel cells;
controlling the supplying using a control system; and
deactivating at least one of the fuel cells.

303. The method according to claim 302 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

304. A method of controlling a fuel cell power system comprising:
providing at least one fuel cell configured to convert chemical energy into electricity;

providing a first terminal coupled with the at least one fuel cell;
providing a second terminal coupled with the at least one fuel cell;
providing a control system comprising a plurality of distributed controllers;
shunting the at least one fuel cell; and
controlling the shunting using the control system.

305. A method of controlling a fuel cell power system comprising:
providing at least one fuel cell configured to convert chemical energy into electricity;

providing a first terminal coupled with the at least one fuel cell;
providing a second terminal coupled with the at least one fuel cell;
providing a control system comprising a plurality of distributed controllers;
switching a connection immediate one of the terminals and the at least one fuel cell; and
controlling the switching using the control system.

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306. A fuel cell power system comprising:

a plurality of fuel cells electrically coupled with plural terminals and individually configured to convert chemical energy into electricity;

a digital control system configured to at least one of control and monitor an operation of the fuel cells; and

a plurality of switching devices configured to selectively shunt respective fuel cells.

307. The fuel cell power system according to claim 306 wherein the control system is configured to monitor at least one electrical characteristic of the fuel cells and to control the switching devices responsive to the monitoring.

308. A fuel cell power system comprising:

a plurality of fuel cells electrically coupled with plural terminals and individually configured to convert chemical energy into electricity;

a digital control system configured to at least one of control and monitor an operation of the fuel cells;

a housing about the fuel cells;

a temperature sensor within the housing; and

an air temperature control assembly configured to at least one of increase and decrease the temperature in the housing.

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309. The fuel cell power system according to claim 308 wherein the control system is configured to monitor temperature using the temperature sensor and to control the air temperature control assembly responsive to the monitoring to maintain the temperature within the housing within a predefined range.

310. The fuel cell power system according to claim 308 wherein the control system is configured to monitor temperature using the temperature sensor and to control the air temperature control assembly responsive to the monitoring to maintain the temperature within the housing within a predefined range of approximately 25 °Celsius to 80 °Celsius.

295 311. (New) A fuel cell power system comprising:

a plurality of terminals;

26 at least one fuel cell electrically coupled with the terminals and configured to convert chemical energy into electricity;

a power supply comprising a battery; and

a control system comprising a plurality of distributed controllers configured to receive electricity from the battery and to at least one of control and monitor at least one operation of at least the one of the fuel cells.

296 312. (New) A fuel cell power system comprising:

a plurality of terminals;

a plurality of fuel cells electrically coupled with the terminals and configured to convert chemical energy into electricity;

a power supply comprising a battery; and

a control system configured to receive electricity from the battery and to at least one of control and monitor at least one operation of at least one of the fuel cells;

wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with others of the fuel cells deactivated.

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298/313. (New) A method of controlling a fuel cell power system comprising:
providing at least one fuel cell configured to convert chemical energy into electricity;

providing a first terminal coupled with the at least one fuel cell;

providing a second terminal coupled with the at least one fuel cell;

selectively bleeding a connection coupled with the at least one fuel cell to purge matter from the at least one fuel cell; and

controlling the bleeding using a control system comprising a plurality of distributed controllers.

298/314. (New) A method of controlling a fuel cell power system comprising:
providing at least one fuel cell configured to convert chemical energy into electricity;

providing a first terminal coupled with the at least one fuel cell;

providing a second terminal coupled with the at least one fuel cell;

supplying electricity to a control system comprising a plurality of distributed controllers using a power supply comprising a battery; and

monitoring at least one operation of the at least one fuel cell using the control system.

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299/315

(New) A method of controlling a fuel cell power system comprising:
providing at least one fuel cell configured to convert chemical energy into electricity;

providing a first terminal coupled with the at least one fuel cell;

providing a second terminal coupled with the at least one fuel cell;

supplying electricity to a control system using a power supply comprising a battery;

monitoring at least one operation of the at least one fuel cell using the control system;

monitoring an electrical condition of the battery; and

controlling charging of the battery responsive to the monitoring of the electrical condition of the battery.

161

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300 3/16. (New) A method of controlling a fuel cell power system comprising:

- providing at least one fuel cell configured to convert chemical energy into electricity;
- providing a first terminal coupled with the at least one fuel cell;
- providing a second terminal coupled with the at least one fuel cell;
- supplying electricity to a control system using a power supply comprising a battery;
- monitoring at least one operation of the at least one fuel cell using the control system;
- charging the battery; and
- controlling the charging using the control system.

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